ASSESSMENT INNOVATION IN RADIOGRAPHIC PATHOLOGY II

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Abstract

Innovation in teaching and learning compel facilitators to explore creative possibilities in teaching and learning. Consequently innovative assessment has replaced traditional assessment methods in the Radiographic Pathology II module. The use of an appropriate variety of assessment methods or approaches is crucial to enhance and support learning and measure performance. Thus assessment has to change from knowledge acquisition and factual recall to assess more embracing and critical learning outcomes such as problem-solving, communication, attitudes, critical thinking, professionalism and ethics. Moreover, assessment has to impact positively on learning, promote deep learning and correspond with the learning outcomes of the module. Addressing these demands in assessment, this paper presents practical examples of assessment innovation during 2004 in the Radiographic Pathology II module.

1. INTRODUCTION

In the Radiography programme, learners learn to produce radiographic images of specific organs and/or conditions of the patient with x-rays. It necessitates learners to integrate knowledge from the different learning areas in the modules. In producing the X-ray films of the patient, learners also require specific skills which they have to apply in practice.

Radiographic Pathology II is one of the modules in the second year of the Radiography programme where learners learn about the different conditions of patients and how these conditions are imaged in the radiology department. Learners also have to learn to recognise the patterns of diseases on radiographs (the X-ray film). Thus in addition to the learners' aforementioned required knowledge and skills, development of qualities in the learners such as critical thinking and problem-solving is essential. Traditional assessment methods used in Radiographic Pathology II, with the focus mainly on assessment of knowledge, therefore seem inadequate. The reliability and validity of traditional assessment methods are thus questionable specifically with relevance to the assessment of skills and qualities such as problem-solving, critical thinking and knowledge acquisition of the learners.

Responding to the abovementioned educational trends it was vital to revisit the Radiographic Pathology II module by exploring the creative possibilities of teaching and learning and replace traditional assessment methods with innovative assessment. Innovation means changing for the better, revolution and transformation. Hence this paper presented at the Teaching and Learning conference, Central University of Technology, Free State on 24 November 2004 addresses innovation in assessment in the Radiographic Pathology II module.

The process to revisit assessment in Radiographic Pathology II was verified by the factors associated with a learner-centred educational approach. Some of these factors are the establishment of a learner-centred environment and addressing the cognitive diversity of the learner population. Moreover assessment methods should be fit for purpose, so it has to be focused on the learning outcomes and coincide with the learning facilitation methods. Assessment has to contribute to the establishment of a learning community and an assessment culture. Assessment also has to be academically challenging and stimulating for the learner. Besides, the assessment process should make the learner feel appreciated, acknowledged and respected (CUT 2004b:3, 4).

In the next section, the innovative assessment methods that were used in the Radiographic Pathology II module are substantiated by the literature on innovative assessment of learning and a learner-centred approach.

2. A BACKGROUND ON ASSESSMENT OF LEARNING

Recommendations in literature on assessment of learning and a learner-centred approach were hence used to support the need of taking a fresh look at assessment of learning as the basis for the innovation in assessment in the Radiographic Pathology II module. A summary of these recommendations are thus provided.

A factor commonly disregarded is that assessment can become the motivating force for learners to learn. Assessment drives learning through the content, the format and timing. Thus a critical question to ask when doing assessment is what is the impact on learning when the specific assessment method is used (Shumway & Harden 2003:569,572,573).

An appropriate variety of assessment methods or tools are necessary to enhance and support learning and measure performance. Assessment has to change from knowledge acquisition and factual recall to assess more embracing and critical learning outcomes such as problem-solving, communication, attitudes, critical thinking, professionalism and ethics (Shumway & Harden 2003:571). Specific assessment methods should be used, i.e. those that promote deep learning and those that best provide evidence of the learning that you are assessing (Killen & Hattingh 2004:84). Entwistle (2000:16) mentions that deep learning can be promoted through assessment by focusing on understanding performance, using tasks to develop and demonstrate understanding and feedback on assessment for clarification.

In addition, performance of health care professionals (such as radiographers) has shifted from their ability to memorise facts to their ability to use new information. The focus now is on clinical and communication skills and the development of attitudes appropriate to the clinical environment (Shumway & Harden 2003:578). The South Africa Qualifications Authority (SAQA) recommends assessment of applied competence, consisting of practical,

foundational and reflexive competence. Practical competence refers to the learner performing a task in an authentic environment. A foundational competence addresses the "what" and "why" of tasks; while the learners' ability to integrate, adjust to changes and abilities to solve problems are revealed through reflexive competence (CUT 2004a: 6).

Miller (in Shumway & Harden 2003:578) proposes a "pyramid of learning" starting with the cognitive levels of the learner and moving towards the behaviour of the learner. Van der Vleuten (in Shumway & Harden 2003:578) links a hierarchy of assessment approaches of increasing authenticity with this "pyramid of learning" (see Figure 1). This can be used in assessment as an indication of the appropriateness of an assessment method, instrument or approach at a specific level. It is shown in Figure 1 that written assessment is predominant at the "know" and "know how" levels while portfolios and observation is predominant at the "does" level.

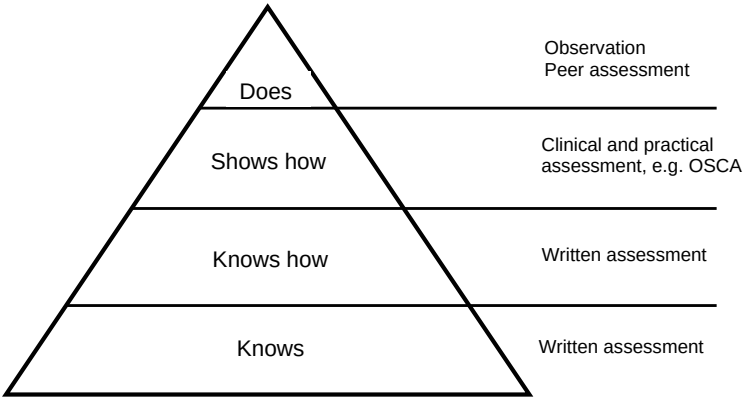

Fig. 1. The learning assessment pyramid (Shumway & Harden 203:578)

Shumway and Harden (2003:570) suggest that the assessment portfolio of the assessor should include written, clinical/practical, observation, portfolio, peer and self-assessment. This assessment portfolio thus includes traditional approaches such as written assessment as well as alternative assessment methods such as performance assessment. In performance assessment the focus is mainly on communication and integrating information from various resources.

3. INNOVATIVE ASSESSMENT IN RADIOGRAPHIC PATHOLOGY II

The above-mentioned information supports the philosophy that innovation in assessment of learning in the Radiographic Pathology II module has to include

an appropriate variety of assessment methods and approaches. This variety of assessment methods and approaches has to focus on the diversity of the learning styles and cognitive abilities of learners to capture the strengths and weaknesses of learners across all competencies. It also has to provide all learners with equal opportunities to succeed academically. This offers learners with a taste of success which should also motivate them to excel academically. Additionally, assessment has to impact positively on learning, promote deep learning and correspond with the learning outcomes of the module. Consequently, approaches such as self- and peer assessment have to be included.

In the next section, practical examples of assessment innovation in the Radiographic Pathology II module are provided. Examples of assessment tools such as the assessment schedule and rubrics containing the assessment criteria are attached to the paper.

3.1 The assessment schedule

The assessment schedule provides information at a glance of learning facilitation and assessment methods in the module (see Appendix I). It contains dates, learning areas, the learning facilitation methods for each learning area, the variety of assessment methods that will be used during the year and if the assessment opportunity is a formative and/or summative event. It also reflects the credits of each assessment opportunity towards the year mark.

Hence the assessment schedule provides learners with guidance of what is expected of them in assessment during the year. It becomes an aid in helping learners to structure their learning for academic achievement. To the facilitator it provides a "roadmap" in planning and doing assessment as well as assistance to coincide the learning facilitation and the assessment methods used in the module.

The formative assessment events contain a number of written tests, regarded as traditional assessment. However, learners also have the opportunity to do a performance assessment such as the Objective Structured Clinical Assessment (OSCA) simulating the authentic situation in practice and a presentation for which peer assessment is used. Learners also have the opportunity to be assessed with a case study assignment and a reflection report (that includes self-assessment). These examples of assessment methods and approaches are briefly explored in the next section.

3.2 Written assessment

Written assessment usually consists of tests that include a diverse range of questions focused on outcomes in the learning area and the method of learning facilitation used. We use Bloom's taxonomy to determine the cognitive level of the questions and to guide the learner to higher order thinking and deep learning (see Appendix II). In the written assessment events we use a mark allocation for paragraph-style questions in which

learners who apply a creative writing style are favoured compared to learners who only provide the essential information.

3.3 Performance assessment

3.3.1 Presentations using peer assessment

This assesses the competence of learners in presenting information to peers and peers then assess one another. Each learner could select their own topic for their presentation. A rubric containing the assessment criteria was used for peer assessment and feedback to the learner (see Appendix III).

3.3.2 Objective Structured Clinical Assessment (OSCA)

The OSCA assesses the knowledge and skills of the learners in a number of learning areas from different modules in the programme. Additionally, it assesses the skill of the learner to integrate the theory with the authentic clinical environment. By doing so it fulfils the aforementioned requirements for radiography learners to be able to develop attitudes appropriate to the clinical environment and apply their skills in practice.

3.4 The case study assignment

This assessment method is used to assess the competence of the learner in retrieving, recording and analysing information from a range of sources. The requirements of the case study assignment are provided to the learner in the learning guide. The learners and the facilitator then negotiate a time schedule and deadlines to help the learners in their self-regulation and time management. The time schedule allows the learners enough time to complete the case study assignment as well as an opportunity to hand in the rough work for feedback from the facilitator before the deadline date. Thus learners who make use of this chance have an opportunity to get feedback, act on the feedback and consequently they could be assured of success in assessment. The rubric, also containing the assessment criteria of the case study assignment, is used for assessment and feedback to the learner (see Appendix IV).

3.5 The reflective report

The use of reflective learning and reflection reports as assessment method dates from as early as 1910. John Dewey (in Leung & Kember 2003:61) describes reflective thought as “active, persistent and careful consideration of any belief or supposed form of knowledge”. It is said to capture qualities such as attitudes, ethics and understanding of the learner. In this way learners discover and reveal their own strengths and weaknesses which correspond with self-assessment.

The last formative assessment for the learners in the Radiographic Pathology II module in 2004 was to write a reflection report. Learners could select any of the topics provided, namely:

- **Formative and summative assessment:** Your assessment on Mondays during 2004 and March, May and September 2004;
- **Experience:** Your experience in the Radiographic Pathology II class in 2004;
- **Assignment:** Your assignment on the Respiratory system.

The task was structured for the learners because it was their first exposure to this assessment method. The learners had to answer questions on the topic that they have selected. These questions were the following:

- What did I learn?
- Specifically how did I learn it?
- Why is the learning of this knowledge important / not important?
- In what way will I be able to use / not be able to use what I have learned?
- What goals will I set to improve on myself and/or the quality of my learning?

The criteria for critical thinking namely the clarity, accuracy, depth, breadth and logic of each section of the report were captured in a rubric that was also used for assessment. Furthermore, the standards of critical thinking are also provided (see Appendix V).

The reflective reports were assessed and returned to the learners for feedback. The facilitator requested from the learners if the information contained in the reflective reports could be used as a guideline for the planning of the 2005 module, thus the content of the reflective reports was summarised. Highlights of the reports are included as Appendix VI. Sixteen learners selected the topic "my experience in the class", eight "the assessment process" and six "the case study assignment".

The nature and content of the reflective reports of the learners exceeded the expectations of the facilitator. This could be because the facilitator did not know what to expect from the learners. However, the surprise could also be linked to the inexperience and ignorance of the facilitator with this assessment method. Learners, who were wrongly labelled as non-performers when it comes to writing, wrote beautiful and comprehensive reports. More so, learners were honest about their own strengths and weaknesses in their reports. Through this assessment experience the facilitator has learned that unique capabilities of learners come to the fore when they are allowed freedom and creativity in writing.

4. DISCUSSION

In the Radiographic Pathology II module, an appropriate range of innovative assessment methods and approaches were used during 2004. These assessment methods and approaches were supported by the literature on assessment of learning, innovation in assessment and a learner-centred approach.

Assessment of learning with an appropriate range of assessment methods provides a vehicle to present evidence of the learning process of the learner.

Literature advises the design of criteria based on the "fit for purpose" principles with which the most appropriate assessment methods in the module are selected (Palomba & Banta 1999:87). The appropriate assessment method should correspond with the learning outcomes and learning facilitation methods used. Assessment methods to assess critical cross-field outcomes such as problem-solving and reflection skills and assessment of performance in practice should be selected.

In response to the mentioned criteria, the range of assessment methods used in the Radiographic Pathology II module in 2004 focused on knowledge acquisition, performance in practice, problem-solving and reflection. The use of these assessment methods is significant in developing our radiography learners as future health care professionals who possess different levels of cognitive skills, the ability to collect and analyse information and an opportunity to proof their performance in the authentic health care environment, sometimes referred to as "the real world". In the same way proof of their problem-solving and reflection skills is provided. Being assessed by the mentioned variety of assessment methods they are able to show that they have the potential to make a difference in the real world.

The use of the assessment schedule, containing the relevant and required information on assessment activities, tools and assessment criteria, helps to provide the learner and the facilitator with direction and transparency in assessment. These aspects impact on the validity and fairness of assessment. Moreover, the assessment criteria offer a means for feedback to the learner. A marking scheme or rubric capturing the assessment criteria and accompanying the assessment for grading purposes can also facilitate feedback to the learner. However, the assessment criteria should be transparent to learners and, where indicated, negotiated with the learners. Feedback to the learner should encourage them to reflect on assessment for future improvements, academic development and achievement.

It is advised that a planning/assessment grid should be used to plan, guide, facilitate and encourage the assessment of a variety of cognitive levels in assessment. In addition to Bloom's taxonomy and the pyramid of learning (see Figure 1), Biggs and Collis (1982:181), Imrie (1995:186) as well as Killen and Hattingh (2004:77) advise the use of the Structure of the Observed Learning Outcome (SOLO) Taxonomy as a framework for judging the quality of learning and the structure of for example essays and medical diagnoses. The assessor should be focused in guiding learners to higher cognitive levels. By doing so they assist learners to grow and develop as critical and creative thinkers and focus assessment on deep learning.

Factors associated with assessment of learning such as its powerful role to direct learning, the potential of assessment to positively impact on learning and its ability to drive learning highlights the importance of quality assessment of learners. Likewise it emphasises the responsibility of academics to take the assessment of learners seriously and to practise assessment in a responsible manner by applying ethical principles in assessment. Brown, Race and Smith (1996:142) describe the "assessment manifesto" containing the ideal principles

of assessment of learners in the programme. By using these guidelines when assessing learners, academics respond positively to the vital requirement of ethical practices in assessment. This means that learners, as important partners in assessment, should be treated with respect.

5. CONCLUSION

Assessment of learning is a complex process. However, it has the potential to add value to learning and thereby enhancing the learning experience of the learner. Thus through innovation in assessment in the Radiographic Pathology II module in 2004, the development of additional skills, competencies and qualities in the radiography learners and their academic progress were carefully observed and monitored. For the facilitator it was more than rewarding to witness the progress of learners. The information provided in the reflection reports of the learners then confirmed that their abilities to think critically, solve problems and to reflect in practice have developed through innovating learning facilitation and assessment. Additionally, these reports provided useful information on how the learners have experienced these innovative learning facilitation and assessment methods that were used in the Radiographic Pathology II module.

The reflection reports of the radiography learners revealed that the diversity in learners in their learning styles, cognitive abilities, ability to perform academically and their strengths and weaknesses were addressed by using an appropriate variety of assessment methods. Consequently it has offered each learner with an opportunity to succeed academically, taste success and grow in confidence. We can thus maintain that innovation in assessment in Radiographic Pathology II has contributed to the holistic development of our radiography learners as independent thinkers, problem-solvers and ultimately as health care workers who have the ability to make a difference in the real world.

6. RESOURCES

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